

NESTABLE BARRICADE AND METHOD OF DEPLOYING BARRICADES

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. Provisional Application Serial No. 60/398,581 filed on July 26, 2002.

BACKGROUND OF THE INVENTION

[0002] Barricades are often used for crowd control and commercial construction. They are often placed end-to-end to control crowds or to inhibit access to a hazardous area such as, for example, a construction zone. The barricades inhibit access by isolating areas of concern from pedestrian traffic and/or by directing traffic away from such areas.

[0003] An A-frame barricade often has two identical ends that support a horizontal cross-beam at a specified height above the ground. The beam may function as a barrier and may also serve to display reflective sheeting or graphic material to communicate a safety message. A-frame barricades are popular because they are reliable and easily recognized as barricades.

[0004] Barricades typically have to be transported to the location of use, stored, positioned, repositioned, and ultimately removed from the site. Some are individually assembled and disassembled. Conventional barricades are typically large and cumbersome. When multiple barricades are used, they are often inefficiently stored and are not easily transported.

[0005] To address this problem, some barricades can be folded. Similarly, other barricades have been designed to be disassembled. Although folding and disassembly of a single barricade is relatively easy, it is time consuming when multiple barricades are involved.

[0006] Additionally, the folded and disassembled barricades must be stored in an organized, stable manner. Although the folded and disassembled barricades could be placed on a cart or platform, the cart or platform constitutes an additional piece of equipment that must be purchased, inventoried, managed, and stored. Further, when setting up a blockade at an outdoor site, the disassembled barricades (in particular) have to be reassembled and carried (or trucked) to the set-up location. The movement and assembly of the barricades can be both difficult and time consuming. Furthermore, when the barricade is disassembled and stored, the parts may be lost or broken, and efforts must be made to organize the parts.

SUMMARY OF THE INVENTION

[0007] An aspect of the present invention relates to a nestable barricade including a cross-beam having a cavity configured to receive a portion of a second nestable barricade to permit nesting of the barricades, a first frame connected to an end portion of the cross-beam for

providing support to the cross-beam, and a second frame connected to an end portion of the cross-beam for providing support to the cross-beam.

[0008] Another aspect of the present invention relates to a barricade including a cross-beam having a first end and a second end, a first frame for providing support to the cross-beam, a second frame for providing support to the cross-beam; a first connection mechanism for releasably connecting the first frame to the first end of the cross-beam in a predetermined, fixed orientation, and a second connection mechanism for releasably connecting the second frame to the second end of the cross-beam in a predetermined, fixed orientation.

[0009] Yet another aspect of the present invention relates to a method of deploying barricades, the method comprising the steps of: providing a first barricade having a cross-beam, a first frame connected to the cross-beam for providing support to the cross-beam, a second frame connected to the cross-beam for providing support to the cross-beam, and rolling members disposed on a bottom portion of each of the first and second frames; providing a second barricade; stacking the second barricade on the first barricade; rolling the first and second barricades to a predetermined area of deployment; removing the second barricade from the first barricade; and deploying the second barricade in a desired location in the vicinity of the predetermined area of deployment.

[0010] Yet another aspect of the present invention relates to a method of deploying barricades, the method comprising the steps of: providing a first barricade; providing a second barricade having a cross-beam with a cavity configured to receive a portion of the first barricade to permit nesting of the first barricade in the second barricade, a first frame connected to the cross-beam for providing support to the cross-beam, a second frame connected to the cross-beam for providing support to the cross-beam; stacking the second barricade on the first barricade so as to nest the first barricade in the second barricade; moving the first and second barricades to a predetermined area of deployment; removing the second barricade from the first barricade; and deploying the second barricade in a desired location in the vicinity of the predetermined area of deployment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate a preferred embodiment of the invention and together with the description, serve to explain principles of the invention.

[0012] Figure 1 is a perspective view of an embodiment of a barricade according to the present invention;

- [0013] Figure 2 is a front view of the barricade of Figure 1;
- [0014] Figure 3A is an unassembled top view of one end of the barricade of Figure 1;
- [0015] Figure 3B is a cross-sectional view of a portion of a cross-beam of the barricade of Figure 1 taken along line IIIB-IIIB in Figure 3A;
- [0016] Figure 4 is a partial front view of one end of the barricade of Figure 1, the end shown having a rolling member;
- [0017] Figure 5 is a partial cross-sectional view of the base of the barricade of Figure 4 that is adapted to accept a rolling member;
- [0018] Figure 6 is a perspective view of a plurality of barricades of the type shown in Figure 1 placed upon each other to create a barricade stack;
- [0019] Figure 7 is a partial cross-sectional view of the two lower barricades of the barricade stack shown in Figure 6, the view showing a clearance between the barricades;
- [0020] Figure 8 is a partial front view of one side of the barricades of Figure 6 with a rolling member on the bottom barricade;
- [0021] Figure 9 is a top view of one end of a cross-beam and associated frame, the view showing an alternate connection mechanism which employs a snap-fit; and
- [0022] Figure 10 is a partial cross sectional view showing another alternate connection mechanism which employs a molded boss.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0023] Reference will now be made in detail to a presently preferred embodiment of the invention, which is illustrated in the accompanying drawings. An effort has been made to use the same reference numbers to refer to the same or like parts.

[0024] Figures 1 to 3B show a preferred embodiment of nestable barricade 10 according to the present invention. In this embodiment, the nestable barricade 10 includes a cross-beam 20, a first or right frame 30, and a second or left frame 30. Preferably the cross-beam 20 and the frames 30 are designed such that when a barricade is assembled, it will nest with a similar barricade to create a barricade stack. Rolling members 40 (see Figures 4 and 5) also can be provided.

[0025] Figures 1 and 2 shows the cross-beam 20, which can be, for example, about four, six, or eight feet long,. As shown in Figure 3B, the cross-beam 20 preferably has a rounded top and a concave underside. The cross-beam preferably has side walls that diverge to form a cavity that preferably extends along the entire length of the cross-beam 20. This shape accommodates the stacking of one barricade 10 upon another like barricade 10.

[0026] A side portion 21 of the cross-beam 20 may include an area or surface for providing or attaching a cautionary image such as, for example, a reflective surface, a graphic image (e.g., universal slip-and-fall warning), verbal information (e.g., “CAUTION,” “CUIDADO,” “ACHTUNG,” etc.), or other customized material, as shown in Figure 4. The top of the cross-beam 20 and/or the top of the frame 30 can also accept accessories, such as a flashing light or other reflective assembly (not shown).

[0027] The right and left frames 30, which are preferably identical in shape, are provided to support the cross-beam 20. The frames 30 are preferably each connected to a respective end portion of the cross-beam 20. More preferably, the frames 30 are each connect to the very ends of the cross-beam 20.

[0028] Figures 2, 3A, and 4 show the frames 30, which are preferably about forty inches high. In this preferred embodiment, each frame 30 has an substantially A-frame shape with a rounded top and two lower legs 50. In addition, as shown Figures 1 and 5-7, the interior of each leg 50 is preferably concave. This concave shape facilitates the stacking of one barricade 10 upon another barricade 10, as shown in Figure 6.

[0029] Each of the frames 30 can be releasably connected to the cross-beam 20 by connection mechanisms formed on the cross-beam 20 and frames 30. Figures 3A and 5 show ends of the cross-beam 20 configured to releaseably engage the frames 30. Preferably, a connection mechanism 25 is formed on corresponding portions of the cross-beam 20 and each respective frame 30. A first connection mechanism 25 is shown in Figure 3A. In this embodiment, the cross-beam 20 has a dovetail tenon 22 sized to be received by a corresponding dovetail mortise 32 formed on the adjacent frame 30. Of course, the tenon 22 could be formed on the frame 30 and the mortise 32 could be formed on the cross-beam 20.

[0030] The connection mechanism can also be, for example, a snap-fit connector 125 that permits flexible projections 122 in the frames 30 to snap into slots 132 in the cross-beam 20 or vice versa, as shown in Figure 9. As the projections 122 are pressed into the slots, they become compressed. However, after being completely passed into the slot, the projections 122 will expand to their original size within a chamber (not shown) behind the slot.

[0031] The connection mechanism can also be a molded boss connector 255 in which a boss 222 is received in a well 232, as shown in Figure 10.

[0032] The above-mentioned connection mechanisms preferably provide a releasable engagement between the cross-beam 20 and the frames 30. As a result of the releasable engagement, the barricade can be disassembled for shipping and/or storage in a substantially

flat configuration. Further, the barricade may be easily assembled and placed atop other like barricades to form a barricade stack. The above-described connection mechanisms can provide ease and speed of assembly and disassembly. It is also possible to attach the frames 30 to the cross-beam 20 with conventional mechanical hardware (not shown); although such mechanical hardware may take longer to assemble and disassemble. By way of further example (not shown), the cross-beam 20 can have mating ends with reduced thicknesses to facilitate connection to the frames 30 for a first time assembly, or if there is a need to disassemble rather than nest.

[0033] The cross-beam 20 and frames 30 of the barricade 10 are preferably molded via an injection molding process. Injection molding permits the thinnest wall section at the lowest manufacturing cost. The walls of the cross-beam 20 and frames 30 are preferably about 0.200 to about 0.300 inches thick, and more preferably about 0.250 inches thick. Such a wall thickness, combined with conventional structural enhancements molded into the frames 30, can provide the function and structural integrity needed to nest several barricades in a static load and to mount rolling members 40 to the base portions 51 of the lower legs 50.

[0034] It should be noted that although injection molding is preferred, it is possible to form the cross-beam 20 and frames 30 via rotational molding, which permits a thin wall, preferably about 0.200 inches thick. It is also possible to form the cross-beam 20 and frames 30 via a blow molding process, which permits a thin wall, preferably about 0.125 inches thick, and a double wall throughout. The overall thickness (two walls and the space between them) is preferably about 0.75 inches to about 2 inches.

[0035] Rolling members 40 can be provided on the legs 50 to render the barricade 10 readily mobile. As shown in Figure 5, the lower end of the leg 50 has a floor portion 52 having a molded boss 60 formed therein. The floor portion 52 forms, in conjunction with a base portion 51, a chamber which is adapted to receive a stem 42 of a rolling member 40. The rolling members 40 can be, for example, conventional wheels or stem casters. The rolling members 40 permit mobility of the barricade or several nested barricades. One or more of the rolling members 40 may also have a conventional locking brake mechanism.

[0036] Although Figures 4 and 5 show only one frame 30, it should be readily recognized that both frames 30 may have rolling members 40. However, in certain applications, it may be preferable to have rolling members 40 on only one of the frames 30. Such applications include situations where there is a concern that the barricade 10 may inadvertently move away from a predetermined area by means of the rolling members 40. For example, if the

predetermined area were located on a hill, gravity may force a barricade 10 having rolling members 40 away from the predetermined area. By way of further example, if the predetermined area were subject to steady wind conditions, the barricade 10 may be apt to be blown away by the wind. If the rolling members are provided on only one of the frames, the barricade may be moved in a manner similar to a wheelbarrow, i.e., by lifting the frame of the barricade that does not have the rolling members.

[0037] If barricades are stacked, mobility can be obtained by providing rolling members 40 on only the lowest barricade 10 in the barricade stack. This can minimize the number of rolling members 40.

[0038] As shown in Figures 6 to 8, a plurality of barricades 10 can be stacked, or nested, one upon another. Figure 7 shows the clearance D, preferably one to two inches, between the cross-beams 20 of two consecutively stacked barricades 10. The clearance D is largely dependent on the size of reinforcing ribs that may be provided.

[0039] Nesting the barricades 10 permits space efficient storage of the barricades 10 in a storage room, truck, or other location. Nesting also can reduce the amount of time required for handling and set up because the barricades do not have to be disassembled and reassembled. Nesting also permits the barricades to be stacked in an organized, sturdy, and safe manner. In addition, providing rolling members 40 on the lowest barricade 10 in a barricade stack enables all of the barricades 10 in a barricade stack to be moved together between a storage area and a predetermined area, without the expense of additional equipment, such as a cart.

[0040] Nesting aids in the deployment of the barricades. For example, barricades can be stacked and then moved to an area of deployment. The can be moved, for example, by rolling them on the rolling members. The barricades can then be removed from the stack and deployed in a desired location.

[0041] The nestable barricade can be used to inhibit access to a predetermined area. Further, the barricade can be designed to be easily moved into the vicinity of the predetermined area. The predetermined area may be a large area such as, for example, a construction site, a work zone, unauthorized area, etc. Similarly, the predetermined area may be small area such as, for example, a hazardous area in a store aisle (e.g., broken glass, wet floor, spilled food, etc.) or outdoors (e.g., loose gravel, a hole in a sidewalk, uneven pavement, pothole, etc.).

[0042] Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is

intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.